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8.2 Discussion of well posed problems for time dependent partial differential equations with constant coefficients and with 1-periodic boundary conditionsChapter 9: Approximations of 1-Periodic Solutions of Partial Differential Equations; 9.1 Approximations of space derivatives; 9.2 Differentiation of Periodic Functions; 9.3 Method of lines; 9.4 Time Discretizations and Stability Analysis; Chapter 10: Linear Initial Boundary Value Problems; 10.1 Well-Posed Initial Boundary Value Problems; 10.2 Method of lines; Chapter 11: Nonlinear Problems
11.1 Initial value problems for ordinary differential equations11.2 Existence theorems for nonlinear partial differential equations; 11.3 Nonlinear example: Burgers' equation; Appendix A: Auxiliary Material; A.1 Some useful Taylor series; A.2 "O" notation; A.3 Solution expansion; Appendix B: Solutions to Exercises; References; Index

Sommario/riassunto

Introduces both the fundamentals of time dependent differential equations and their numerical solutions Introduction to Numerical Methods for Time Dependent Differential Equations delves into the underlying mathematical theory needed to solve time dependent differential equations numerically. Written as a self-contained introduction, the book is divided into two parts to emphasize both ordinary differential equations (ODEs) and partial differential equations (PDEs). Beginning with ODEs and their approximations, the authors provide a crucial presentation of fundamen